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Response
No.
Date

APPLICANT: B. Martinez-Tovar et al : GROUP ART UNIT: 3641
 SERIAL NO: 09/470,343 :
 FILING DATE: December 22, 1999 : EXAMINER: T. Chambers
 TITLE: TITANIUM SEMICONDUCTOR BRIDGE :
 IGNITER : ATTY. DKT.: P-1583

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

July 10, 2003

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INTRODUCTORY COMMENTS

Dear Sir:

This paper is responsive to the 'final' office action mailed June 25, 2003 in the captioned application.

RESPONSE

Claims 1-24 are pending in the subject application. Claims 1-11 and 18-20 have been allowed, and the Examiner has provided reasons for allowance in paragraph 7 of the office action. Claims 12-17 and 21-24 stand rejected under 35 USC 102.

Rejection of Claims 12-17 and 21-24 Under 35 USC 102

Claims 12-17 and 21-24 stand rejected under 35 USC 102 as being anticipated by PCT Publication WO 9742462 issued to Martinez-Tovar. Claim 12 is drawn to a semiconductor bridge igniter having disposed on the bridge a layer of titanium that has been pre-conditioned to be stabilized against temperature-induced variations in resistance. Claim 21 defines a method for initiating an energetic material using a semiconductor bridge igniter having a layer of solid metal on the bridge, the method comprising applying a voltage that melts the metal and removes solid metal from between the bridge and the energetic material.

With respect to claim 12, and in response to the Applicant's prior arguments concerning the distinction between claim 12 and Martinez-Tovar, the Examiner states that Martinez-Tovar shows, at page 10, lines 6-23, Applicants' preconditioning process.

The Examiner is respectfully reminded that the cited passage of Martinez-Tovar addresses the need in the prior art for thermal annealing an igniter device that comprises a layer of aluminum or tungsten on a semiconductor surface. Claim 12 does not recite either of those metals. Furthermore, Martinez-Tovar characterizes the annealing process relative to the aluminum and tungsten as a disadvantage, and states that the invention disclosed therein overcomes that shortcoming by including titanium in the metal layer on the semiconductor bridge, with the result that the multi-layered device need not be annealed. (See page 11, lines 6-14.) Accordingly, not only does Martinez-Tovar fail to disclose a semiconductor bridge device with a layer of titanium annealed on the semiconductor material as described in claim 12, it teaches away from such a device. Accordingly, the stated ground of rejection of claim 12 and the claims dependent therefrom is respectfully traversed.

Regarding claim 21, the Examiner asserts that it would be clear to one of ordinary skill in the art that the Martinez-Tovar device required additional voltage in order to melt the metal layer on the semiconductor bridge. However, the Examiner has failed to point out where in Martinez-Tovar, or elsewhere in the prior art, there is any teaching to this effect or any evidence that the Martinez-Tovar device actually works in the way defined in claim 21. To the

contrary, the Applicant has found that the Martinez-Tovar device operates under the disadvantage of the fact that a layer of metallic tungsten remains between the semiconductor bridge and the energetic material when the device is ignited, because of the excessive temperature difference between the melting point of tungsten and the vaporization temperature of the semiconductor material in the bridge. (See the application at page 3, lines 24-31.) The claimed invention overcomes this disadvantage by defining a semiconductor bridge having a metal thereon whose melting temperature is close to the vaporization temperature of the semiconductor material, and which is therefore melted by the vaporized semiconductor material. In its molten form, the metal layer does not impede the initiation of the reactive material by the vaporized semiconductor material. (See the application at page 4, lines 1-20.)

The Examiner's assertion that one of ordinary skill in the art would know that a higher voltage than is sufficient to vaporize the semiconductor material of the bridge should be used with the Martinez-Tovar device so that it functions according to the claimed invention appears to draw a suggestion from the Applicant's disclosure, since no such suggestion is evident in the prior art. It is well established, however, that such reasoning does not constitute a proper basis on which to reject a claim.

Since the Applicant has found that the Martinez-Tovar device does not function in the way described in claim 12, and since the Examiner has failed to show any teaching in the prior art to the contrary, the stated ground of rejection is respectfully traversed.

Rejection of Claims 21-23 Under 35 USC 102

Claims 21-23 stand rejected under 35 USC 102 as being anticipated by U.S. 4,976,200 to Benson et al.

Like Martinez-Tovar, Benson discloses a tungsten bridge device, and fails to anticipate the method described in claims 21-23 because it does not function as defined in those claims. Rather than melting the metal layer, Benson provides voltage that produces a lateral burn and intense plasma. (See column 5, lines 37-50.) Nowhere does Benson teach or suggest melting the metal layer to remove solid metal from between the semiconductor material and the energetic material. Accordingly, the stated ground of rejection is respectfully traversed.

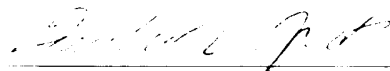
Reexamination and reconsideration of claims 12-17 and 21-24 in view of the foregoing remarks is respectfully requested.

The Stated Reasons for Allowance of Claims 1-11 and 18-20

The Applicant disagrees with the Examiner's interpretation of the "consisting essentially of" language of claims 1 and 18 set forth in paragraph 7 of the office action. The Examiner interprets this language to exclude all metals besides titanium from the metal layer on the semiconductor bridge. The Applicant respectfully submits that by so doing, the Examiner is misinterpreting the claim language and imposing an unnecessary limitation on the invention, as if the phrase "consisting of" were used.

The phrase "consisting essentially of" is well known to indicate the exclusion only of elements that would defeat the novel and basic characteristics of the invention. See MPEP 2111.03. As clearly shown in the application, the basic and novel characteristic of this invention is a semiconductor bridge having a layer of solid metal thereon that is removed from between the semiconductor bridge and the energetic material as part of the initiation process with the vaporization of the semiconductor material thereunder. As taught in the application, this can be achieved by providing a metal layer (such as titanium) that melts at a temperature close to that of the vaporization temperature of the semiconductor material of the bridge, in contrast to the use of tungsten as in Martinez-Tovar, because the melting temperature of tungsten is so high. Accordingly, the "consisting essentially of" phrase will be understood by one of ordinary skill in the art to signal the exclusion of tungsten and other metals whose melting temperatures are so much higher than that of the vaporization temperature of the semiconductor bridge material that the metal layer on the bridge would fail to melt upon vaporization of the semiconductor bridge under normal functioning conditions. However, the claim need not exclude metals with melting temperatures around or below that of titanium, because such metals and alloys could be included and still permit the device to operate as it does with a layer of titanium as described above.

Respectfully submitted,



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 Filing Date 12/22/1999
 First Named Inventor B. Martinez-Tovar
 Art Unit 3641
 Examiner Name T. Chambers
 Attorney Docket Number P-1583

Total Number of Pages in This Submission

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Firm or Individual	Libert & Associates
Signature	<i>Constance M. Pursell</i>
Date	July 10, 2003

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